Assembly Instructions

English

Grundig SAT Systems

Head-End Digital Modulator

DVB-T/-C ➞ COFDM

HDMC 1000 T

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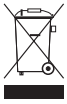
1 Safety regulations and notes

- Assembly, installation and servicing should be carried out by authorised electricians.
- Switch off the operating voltage of the system before beginning with assembly or service work or pull out the mains plug.
- Do not perform installation and service work during thunderstorms.
- Install the system so it will not be able to vibrate…
  - in a dust-free, dry environment
  - in such a manner that it is protected from moisture, fumes, splashing water and dampness
  - somewhere protected from direct sunlight
  - not within the immediate vicinity of heat sources
  - in an ambient temperature of 0 °C to +50 °C. In case of the formation of condensation wait until the system is completely dried.
- Ensure that the head-end station is adequately ventilated. Do not cover the ventilation slots.
- Beware of short circuits
- No liability is accepted for any damage caused by faulty connections or inappropriate handling.
- Observe the relevant standards, regulations and guidelines on the installation and operation of antenna systems.
- The standards EN/DIN EN 50083 resp. IEC/EN/DIN EN 60728 must be observed.
- **For further information please read the assembly instructions for the head-end station used.**
- **Test the software versions of the head-end station and the cassette and update them if necessary. The current software versions can be found at "www.gss.de".**

Take action to prevent static discharge when working on the device!



Electronic devices should never be disposed of in the household rubbish. In accordance with directive 2002/96/EC of the European Parliament and the European Council from January 27, 2003 which addresses old electronic and electrical devices, such devices must be disposed of at a designated collection facility. At the end of its service life, please take your device to one of these public collection facilities for proper disposal.

2 General information

2.1 Packing contents

1 Cassette HDMC 1000 T
2 RF cables
1 Brief assembly instructions

2.2 Meaning of the symbols used

Important note

—> General note

• Performing works

2.3 Technical data

The devices meet the following EU directives:
2006/95/EC, 2004/108/EC
The product fulfils the guidelines and standards for CE labelling (Page 48).

Unless otherwise noted all values are specified as "typical".

RF input

Channels ..... C5…C12, S21…S41, C21…C69
Frequency range: ..... 42 … 866 MHz
Input level: ..... 60 dBµV … 80 dBµV
Symbol rate ..... acc. to EN 300744

COFDM modulator

Signal processing: ..... DIN EN 300744
Transmission modes: 2k, 4k, 8k
Types of modulation: ..... QPSK, 16 QAM, 64 QAM
Code rates: ..... $^{1}/_{2}$, $^{2}/_{3}$, $^{3}/_{4}$, $^{5}/_{6}$, $^{7}/_{8}$
Guard intervals: ..... $^{1}/_{4}$, $^{1}/_{8}$, $^{1}/_{16}$, $^{1}/_{32}$

RF output

Frequency range: ..... 42.0 MHz … 860.0 MHz
Channels: ..... C5 … C12, C21 … C69
Output level: ..... 96 dBµV
Output impedance: ..... 75 Ω

ASI interfaces

Standard: .....DIN EN 50083-9
Format: .....MPEG ISO IEC 13818-1
User data rate: .....2 ... 90 Mbit/s
Level (input / output): ..... 800 mV_{PP} ± 10%
Return loss (input):.....> 17 dB (5 ... 270 MHz)

Connections

RF inputs:.....2 F sockets
RF output: ..... 1 IEC socket
ASI input: .....1 BNC socket, 75 Ω
ASI output:.....1 BNC socket, 75 Ω
LAN:..... 1 RJ-45 socket
Connection strip (10-pin): .....for supply voltages and control circuits
RS-232 socket: ..... serial interface for software update
Common Interface: .....several channels can be descrambled.

Remote maintenance

Remotely controllable (via PSW 1000*): .....yes
Remote update (via BEflash*): .....yes

(* and a corresponding management unit)

2.4 Description

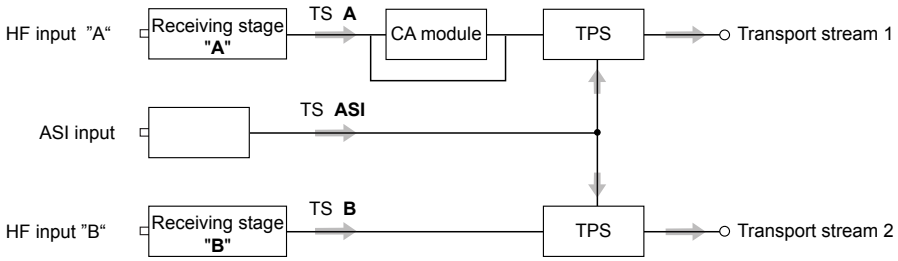
The double transmodulator cassette is a converter, which converts COFDM and QAM modulated signals into two COFDM modulated signals for feeding into a cable network. The cassette has two RF inputs and one RF output. Additionally it is equipped with an ASI input and an ASI output (ASI – Asynchronous Serial Interface according to EN 50083-9).

The transport stream fed via the ASI socket can be inserted into the transport streams of the receiving stages via the TPS module. The signal path is set in the menu items input signal path "**INROUTE**" and output signal path "**OUTROUTE**".

Input signal path "INROUTE"

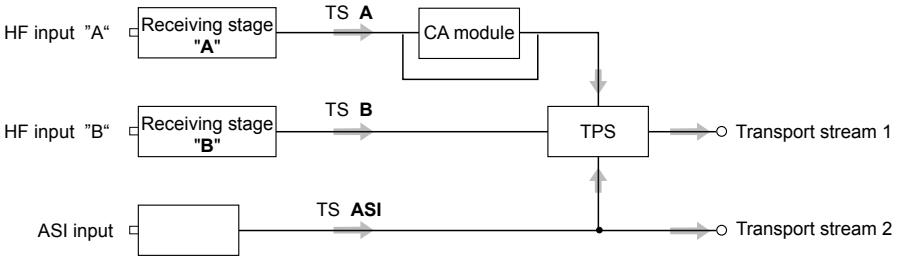
Menu setting "A+ASI = 1 B+ASI = 2"

The transport streams of the receiving stage "TS **A**" and of the ASI input "TS **ASI**" generate the transport stream 1. The transport streams of the receiving stage "TS **B**" and of the ASI input "TS **ASI**" generate the transport stream 2.



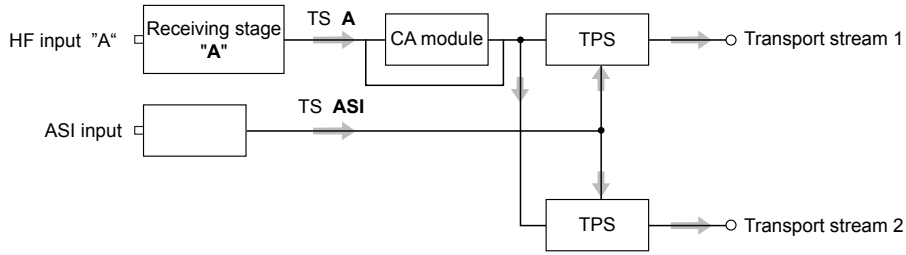
Menu setting "A+B+ASI = 1 ASI = 2"

The transport streams of the receiving stages "TS **A**" and "TS **B**" and of the ASI input "TS **ASI**" generate the transport stream 1. The "TS **ASI**" transport stream fed via the ASI input generates the transport stream 2.



Menu setting "A+ASI = 1 A+ASI = 2"

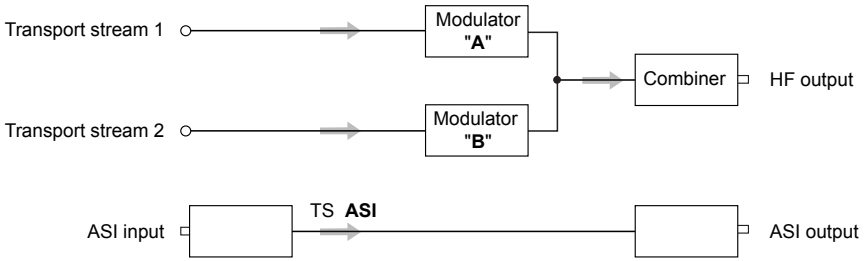
The transport streams of the receiving stage "**A**" "TS **A**" and of the ASI input "TS **ASI**" are split into transport stream 1 and 2. Receiving stage "**B**" is not used.



Output signal path "OUTROUTE"

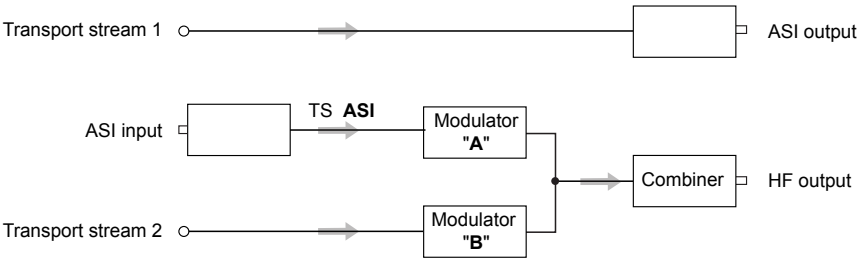
Menu setting "ASI => ASI"

Transport stream 1 is made available via modulator "**A**", transport stream 2 via modulator "**B**" and the transport stream from the ASI input "TS **ASI**" via the ASI output.



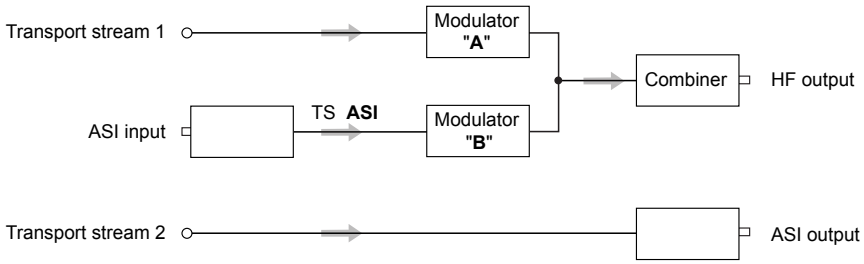
Menu setting "1 => ASI ASI => MA"

Transport stream 1 is made available via the ASI output, transport stream 2 via modulator "**B**" and the transport stream from the ASI input "TS **ASI**" via modulator "**A**" (MA).



Menu setting "2 => ASI ASI => MB"

Transport stream 1 is made available via modulator "**A**", transport stream 2 via the ASI output and the transport stream from the ASI input "TS **ASI**" via modulator "**B**" (MB).



The cassette is equipped with two channel strips ("**A**" and "**B**"). The channel strips consist of the DVB-T/-C tuners, the digital signal preparation units and the output converter. The channel strips are indicated in the head-end station display with "**Bx ...A**" and "**Bx ...B**". Using an adequate CA module scrambled channels can be descrambled via channel strip "**A**". The control of the cassette takes place via the control unit of the head-end station.
Two LEDs provide an indication of the input signal quality based on their colour and indicate if the respective channel strip is switched on (LED illuminates) or off. During the boot process both LEDs are blinking.
The integrated TPS module (Transport Stream Processing) processes the data of the transport streams.
The COFDM modulated RF output signals are sent through the RF output of the cassette to the RF output collector. The common output level of the channel strips can be set at the output collector. Additionally a transport stream is made available via the ASI output dependent on the signal path set.
When the head-end station is switched on, the two-line LC display shows the software version of the control unit. To operate this cassette the software version of the control unit must be "**V 44**" or higher. You can find the current operating software for the control unit and the cassette, the software "**BE-Flash**" and the current assembly instructions on the website "***www.gss.de***".

The cassette is intended for use in the STANDARD LINE head-end stations.

2.5 Software query

Control unit

If necessary, you can activate the indication of the software version of the control unit manually:

- Press any two keys on the control unit of the head-end station simultaneously until the display goes dark and the software version, e.g. "**V 44**" appears.

Cassette

The software version of the cassette is shown in the display after activating the cassette (see page 20).

2.6 How the TPS module works

After decoding COFDM or QAM-modulated signals, the demodulated data streams and the data stream fed via the ASI socket can be accessed via the integrated TPS module. These data streams, also called transport streams, contain several stations in all their components (video, audio, data and service information), which can be changed using the TPS module.

Station filter

Individual stations can be deleted. This reduces the data rate and, consequently, the output symbol rate. Additionally stations of the different transport streams can be assembled to a new transport stream.

Stuffing

The transport stream is padded using what is known as zero data. This ensures a steady and constant output data rate.

Changing the Transport stream and ORGNET-ID

The transport stream ID can be changed. If the stations of a transponder are split into the transport streams of the channel strips "A" and "B", one of the both transport streams a new identification must be allocated to realise the channel search of the settop boxes connected without mistakes.
If the ORGNET-ID is changed a new NIT must be generated.

Changing the NIT

The transport stream contains data in the form of tables which the receivers evaluate and require for convenient use. The TPS module can adjust the "Network Information Table" (NIT) to accommodate the new station data. The "NIT" contains data which is required by the set-top boxes connected to the cable network for the automatic search feature.

Changing the operator ID (CAT)

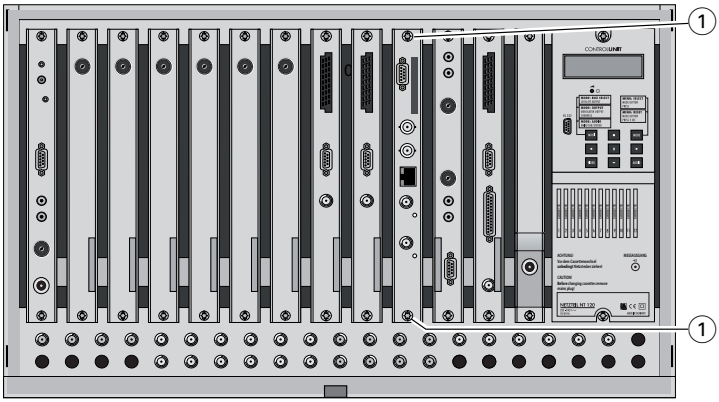
Some network operators transmit an operator ID in the data stream (e.g. visAvision). By changing the CAT the operator ID can be adjusted to the current demands.

3 Assembly

3.1 Installing the cassette

– Ensure the head-end station is mounted so it will not be able to vibrate. Avoid, for example, mounting the head-end station onto a lift shaft or any other wall or floor construction that vibrates in a similar way.
– Before installing or changing a cassette unplug the power cable from the mains power socket.

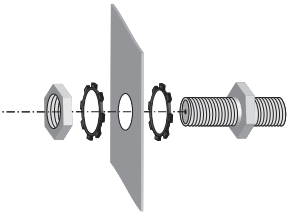
- Remove the fastening screws (1) of an unoccupied slot from the bracket of the head-end station.
- Insert the cassette in this slot and push it into the housing.
- Align the cassette and apply slight pressure to connect it to the connections of the board and the RF bus bar.
- Fasten the cassette with the screws (1).



3.2 EMC REGULATIONS

To comply with the current EMC regulations, it is necessary to connect the lines leading in and out of the head-end station using cable terminals.
When mounting the cassette in a head-end station which is installed in a 19" cabinet, make sure the connections leading in and out for the 19" cabinet are made using cable terminals.

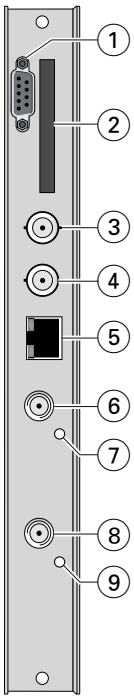
The attenuation of shielding of the connection lines for ASI and antenna must meet the requirements for "Class A".



- Insert the required number of cable terminals in the openings provided in the head-end station or in the 19" cabinet.

Tighten the nuts on the cable terminals until the teeth on the lock washer have penetrated the exterior coating and a good connection is made between the housing and cable terminals.

3.3 Overview of the cassette



① D-SUB socket "RS-232"
② Slot for a CA module
③ ASI output
④ ASI input
⑤ LAN socket not used
(intended for additional functions)
⑥ RF input "**A**" (channel strip "**A**"))
⑦ Status LED channel strip "**A**"
⑧ RF input "**B**" (channel strip "**B**")
⑨ Status LED channel strip "**B**"

The operating software of the cassette can be updated via the 9-pin D-SUB socket "RS-232" using a PC or notebook and the software "**BE-Flash**".
You can find the current operating software on the website "***www.gss.de***".

—> The status LEDs indicate the quality of the received transport streams:

LED indicator	Indication
Blinking green	Boot process
Green	Signal quality is good
Yellow	Signal quality is insufficient
Red	No signal
Off	The channel strip (modulator) is switched off

3.4 Connecting the cassette

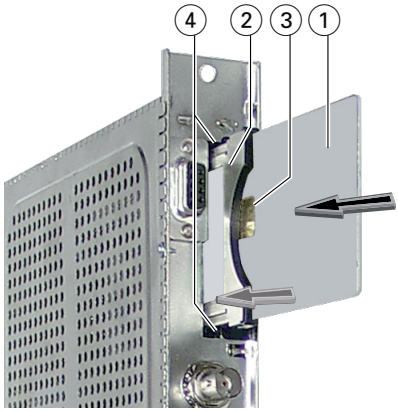
- Connect the RF connections to the inputs ⑥ (channel strip "**A**") and ⑧ (channel strip "**B**") .
- Connect the ASI input ④ and the ASI output ③ to the peripheral ASI devices.

3.5 Retrofitting a CA module

The cassette is equipped with a common interface. It allows you to connect a CA module for various scrambling systems and service providers. Scrambled channels can only be descrambled with a CA module suitable for the scrambling system and the corresponding smart card. The smart card contains all the information for authorisation, descrambling and subscription.

– Check with the distributor or manufacturer of the CA module to be used to ensure that it is suitable for descrambling several channels.
– **The hardware and software of this cassette have been thoroughly prepared and tested.**
Any changes made by programme provider to the structures in the programme data might impair or even prevent this function.
– When working with the CA module, please read the corresponding operating manual from the respective provider.

- Insert the smart card (1) into the CA module (2) so that the chip (3) on the smart card faces the thicker side (top) of the CA module.
- Insert the CA module into the guide rails of the CA slot (4) with the top side of the CA module facing the top side of the cassette.
- Push the CA module without canting into the guide rails of the CA slot (4) and contact it to the common interface.



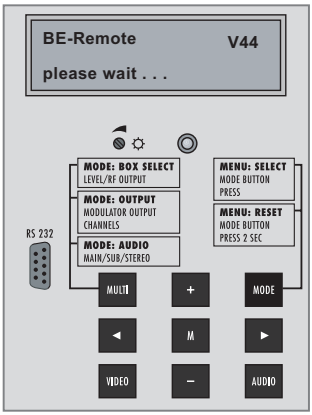
4 The control panel at a glance

4.1 Menu items

Programme the cassette using the buttons on the control unit of the head-end station. The two-line display of the control unit then shows the menus.
The parameters and functions to be set are underlined.

Use the **MODE** key to select the following main menu items:

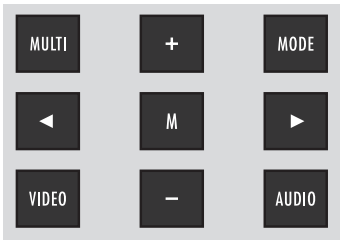
- Input signal path
- Output signal path
- Channel strip
- Channel / frequency selection
- Output channel / output frequency
- Output level
- Input modulation
- Input channel / frequency
- Station filter
- CA module (if available)
- Output parameters
- Stuffing
- Substitute signal
- Transport stream and ORGNET-ID
- Network Information Table (NIT)
- Network/operator identification
- Deleting a PID
- Renaming a PID
- Factory reset
- Reset



4.2 Control panel

The key pad on the head-end station is used to scroll through the menus step-by-step:

MODE scrolls forward through the menus.
◄ / **►** select parameters in the menus.
+ / **-** set values, initiate actions.
MULTI selects sub-menus.
AUDIO scrolls backward through the menus.
M saves all entries.



5 Programming

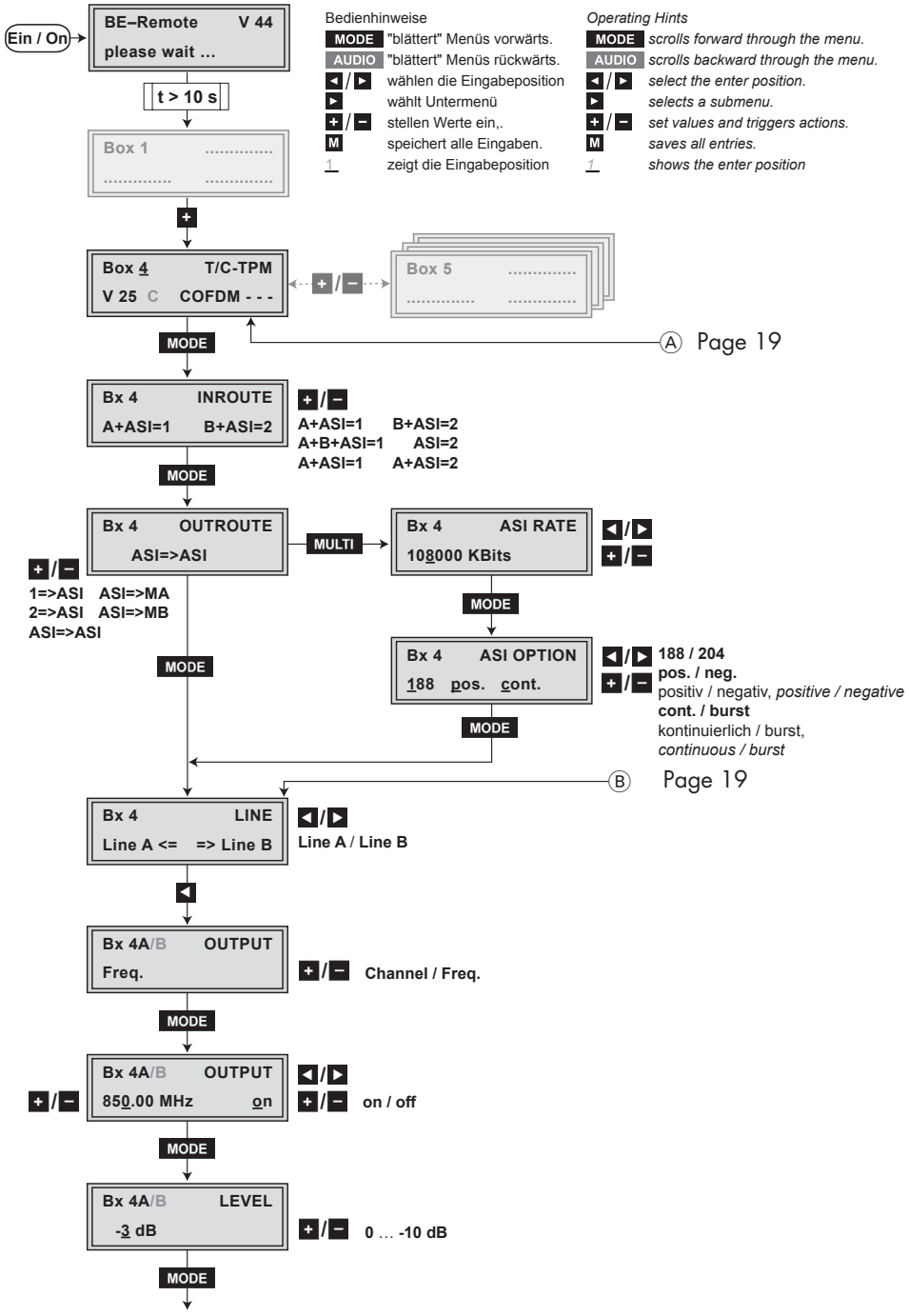
5.1 Preparation

- Test the software versions of the head-end station and the cassette and update them if necessary. The current software versions can be found on the website "***www.gss.de***".
- Connect the test receiver to the RF output or the test output of the head-end station.
- Set the output channel / output frequency of the cassette (page 23) and adjust the TV test receiver to this channel / frequency.
- Switch on the channel strip (modulator) if necessary (page 24). For each channel strip, there is a status LED (page 13) which indicates if the channel strip is switched on.
- Balance the output levels of the channel strips "**A**" and "**B**" if the difference in level is ≥ 1 dB (page 25).

5.2 Notes on level setting

In order to prevent interference within the head-end station and the cable system, the output level of the cassette must be decreased by 8 dB compared to the system level.

- Measure the output levels of the other cassettes and tune them to a uniform output level using the appropriate level controls or software dependent on the head-end station used. Please regard the assembly instructions of the respective head-end station.

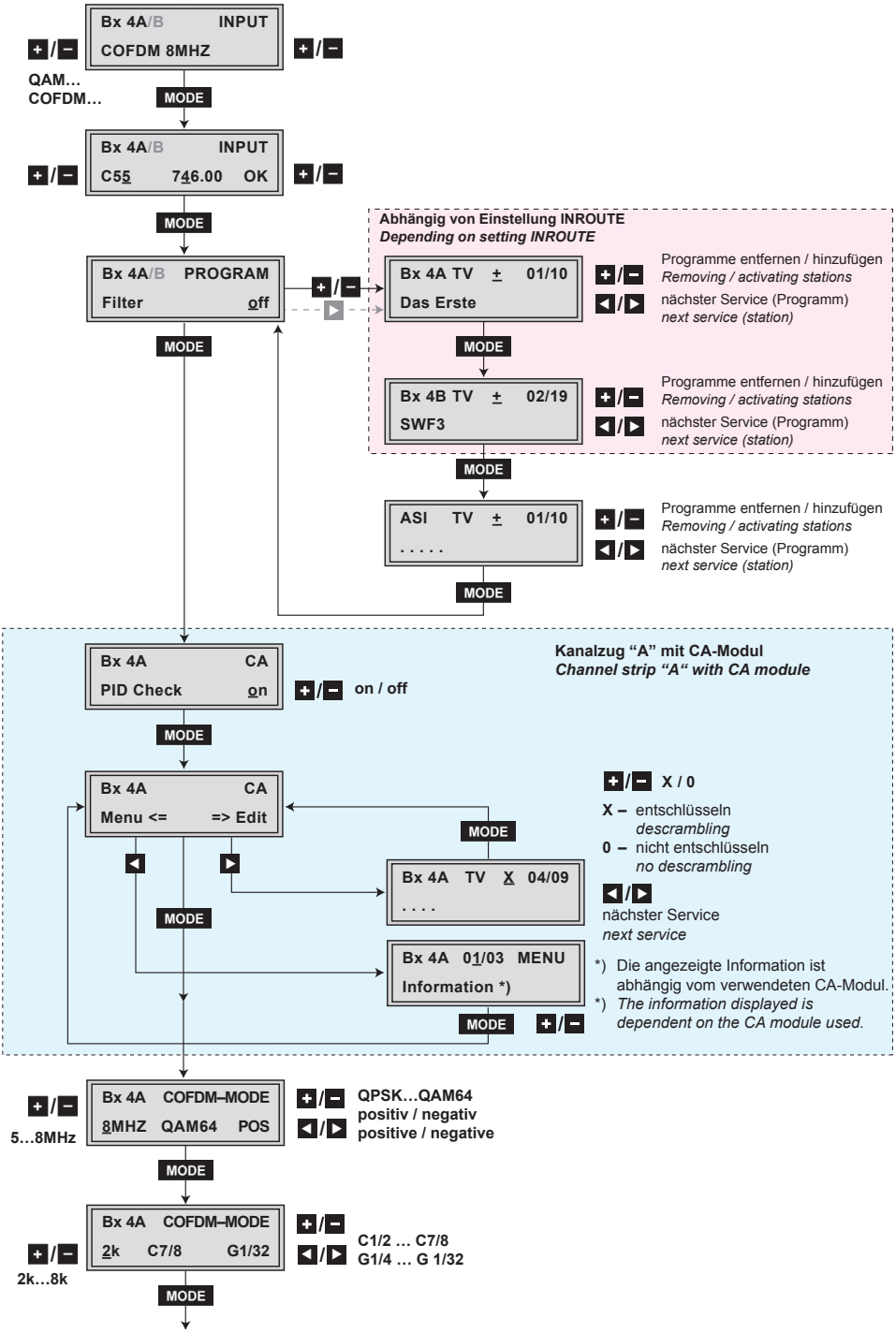


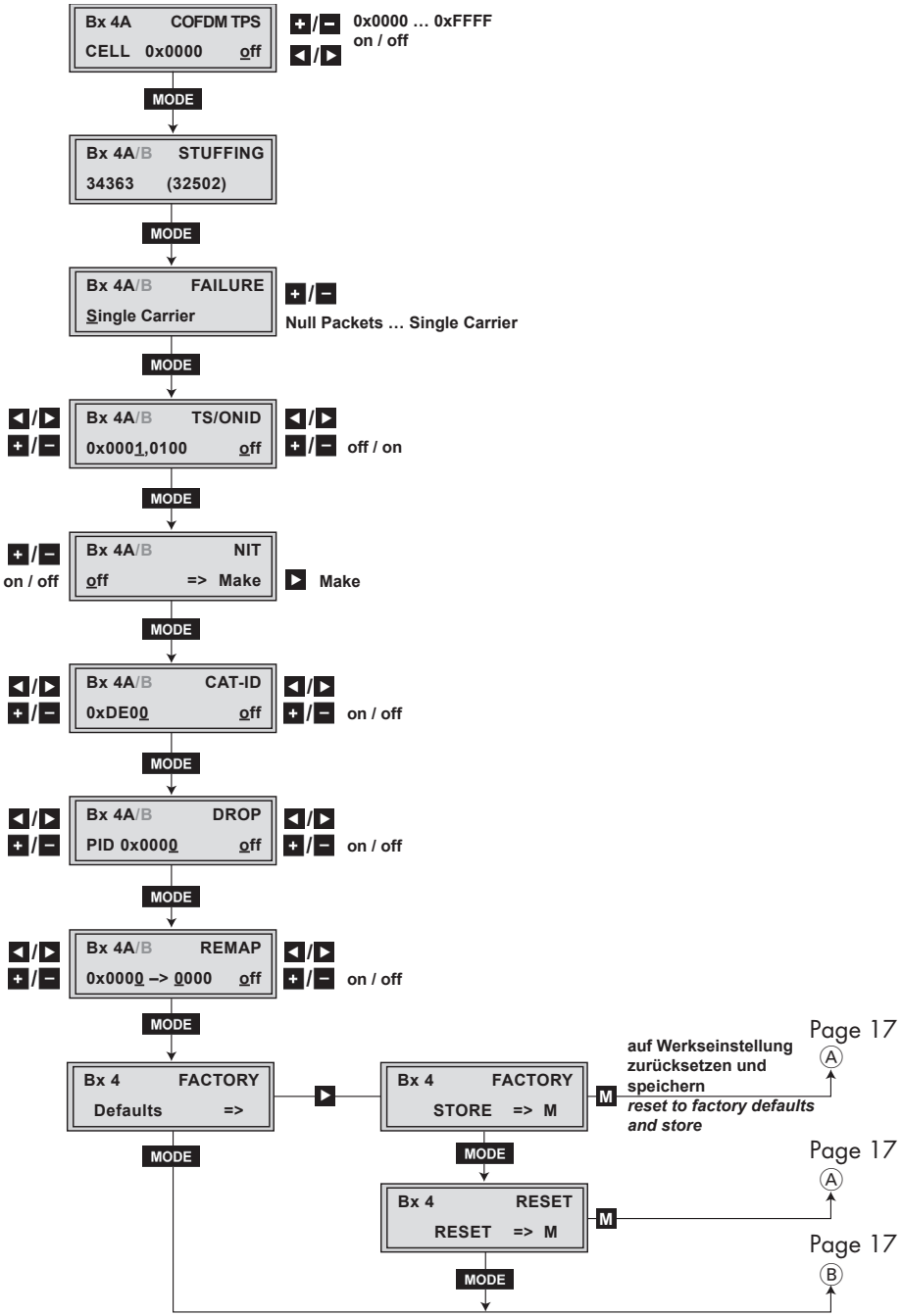
Bedienhinweise

MODE	"blättert" Menüs vorwärts.
AUDIO	"blättert" Menüs rückwärts.
◄ / ►	wählen die Eingabeposition
►	wählt Untermenü
+ / –	stellen Werte ein,.
M	speichert alle Eingaben.
1	zeigt die Eingabeposition

Operating Hints

MODE	*scrolls forward through the menu.*
AUDIO	*scrolls backward through the menu.*
◄ / ►	*select the enter position.*
►	*selects a submenu.*
+ / –	*set values and triggers actions.*
M	*saves all entries.*
1	*shows the enter position*

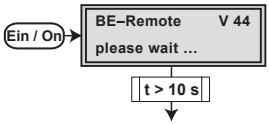

Bx 4A/B INPUT
COFDM 8MHZ
+/–
QAM…
COFDM…
MODE
Bx 4A/B INPUT
C55 746.00 OK
Abhängig von Einstellung INROUTE
Depending on setting INROUTE
Bx 4A/B PROGRAM
Filter off
Bx 4A TV ± 01/10
Das Erste
Programme entfernen / hinzufügen
Removing / activating stations
nächster Service (Programm)
next service (station)
Bx 4B TV ± 02/19
SWF3
ASI TV ± 01/10
. . . . .
Kanalzug "A" mit CA-Modul
Channel strip "A" with CA module
Bx 4A CA
PID Check on
on / off
Bx 4A CA
Menu <= => Edit
Bx 4A TV X 04/09
. . . .
Bx 4A 01/03 MENU
Information *)
X / 0
X – entschlüsseln
descrambling
0 – nicht entschlüsseln
no descrambling
nächster Service
next service
*) Die angezeigte Information ist abhängig vom verwendeten CA-Modul.
*) The information displayed is dependent on the CA module used.
Bx 4A COFDM–MODE
8MHZ QAM64 POS
5…8MHz
QPSK…QAM64
positiv / negativ
positive / negative
Bx 4A COFDM–MODE
2k C7/8 G1/32
2k…8k
C1/2 … C7/8
G1/4 … G 1/32


Bx 4A COFDM TPS
CELL 0x0000 off
+/− 0x0000 … 0xFFFF
◀/▶ on / off
MODE
Bx 4A/B STUFFING
34363 (32502)
MODE
Bx 4A/B FAILURE
Single Carrier
+/− Null Packets … Single Carrier
MODE
◀/▶ +/− Bx 4A/B TS/ONID
0x0001,0100 off
◀/▶ +/− off / on
MODE
+/− on / off Bx 4A/B NIT
off => Make
▶ Make
MODE
◀/▶ +/− Bx 4A/B CAT-ID
0xDE00 off
◀/▶ +/− on / off
MODE
◀/▶ +/− Bx 4A/B DROP
PID 0x0000 off
◀/▶ +/− on / off
MODE
◀/▶ +/− Bx 4A/B REMAP
0x0000 –> 0000 off
◀/▶ +/− on / off
MODE
Bx 4 FACTORY
Defaults =>
▶
Bx 4 FACTORY
STORE => M
M
auf Werkseinstellung zurücksetzen und speichern
reset to factory defaults and store
Page 17
A
MODE
Bx 4 RESET
RESET => M
M
Page 17
A
Page 17
B
MODE

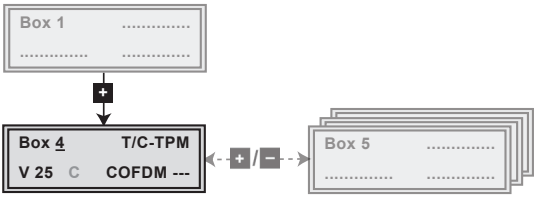
—> Pressing the **MODE** button for longer than 2 seconds cancels the programming procedure. This takes you back to the programme item "Selecting the cassette" from any menu. Any entries that have not been saved are reset to the previous settings.
—> Entries in the menus can be saved by pressing the **M** key. You are taken back to the "Selecting the cassette" menu item.
—> The cursor position for settings is shown by "_".

- Switch on the head-end station

—> The display shows the software version (e.g. V 44)
—> The processor reads the cassettes' data (approximately 10 seconds).



SELECTING THE CASSETTE



- Select the cassette you want to programme (e.g. **Box 4**) by repeatedly pressing the button **+** if necessary.

—> The display shows e.g. the menu : **Box 4 T/C-TPM**
V25 COFDM

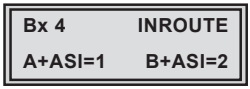
"Box 4"	stands for slot 4
"T/C-TPM COFDM"	Type of cassette
"V 25"	Software version of the cassette

- Press the **MODE** button.

—> The "Input signal path" – "**INROUTE**" menu is activated.

INPUT SIGNAL PATH

In this menu you define the signal path of the input transport streams.
Menu setting "**A+ASI = 1 B+ASI = 2**" (page 7).
Menu setting "**A+B+ASI = 1 ASI = 2**" (page 7).
Menu setting "**A+ASI = 1 A+ASI = 2**" (page 7).



- Use the **+**/**-** buttons to select the signal path wished.
- Press the **MODE** button.

—> The "Output signal path" – "**OUTROUTE**" menu is activated.

OUTPUT SIGNAL PATH

In this menu you define the signal path of the output transport streams.
Menu setting "**ASI => ASI**" (page 8).
Menu setting "**1 => ASI ASI => MA**" (page 8).
Menu setting "**2 => ASI ASI => MB**" (page 8).

- Use the **+**/**-** buttons to select the signal path wished.
- If you do not want to do ASI settings, press the **MODE** button.

—> The "Channel strip" – "**LINE**" menu is activated (page 23).

- Press the **MULTI** button.

—> The "ASI transfer rate" – "**ASI RATE**" menu is activated.

ASI TRANSFER RATE

In this menu you set the output transfer rate for the ASI component connected. For this setting please take the required information from the documentation (technical data) of the ASI component to be connected.

- Use the ◄/► buttons to place the cursor under the digits to be set for the transfer rate then use the + / - buttons to set the transfer rate wished.

- Press the MODE button.

—> The "ASI options" – "**ASI OPTION**" menu is activated.

ASI OPTIONS

In this menu you define the size of the data packets, their polarity and the type of transmission.
For this setting please take the required information from the documentation (technical data) of the ASI component to be connected.

- Press the + / - buttons to set the size of the data packets ("**188**" or "**204**" bits).

- If the polarity of the data to be transmitted has to be changed, press the ◄/► buttons to place the cursor under "**pos.**" (positive – standard) and using the + / - buttons set to "**neg.**" (negative).

- To change the type of transmission press the ◄/► buttons to position the cursor under "**cont.**" (continuous – standard) and using the + / - set to "**burst**".

—> Setting "**cont.**"
The data packets of the user data are collected to a great data packet in the transport stream.

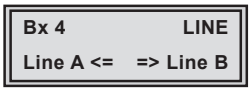
—> Setting "**burst**"
The data packets of the user data are spaced out evenly in the transport stream.

- Press the **MODE** button.

—> The "Channel strip" – "**LINE**" menu is activated.

Channel strip

Herein select the channel strip for which the following settings should be done.



- By pressing ◄ select channel strip "**A**" ("**Line A**") or select channel strip "**B**" ("**Line B**") by pressing the ► button.

—> The "Channel / Frequency setting" – "**OUTPUT**" menu is activated.

Channel / Frequency setting

In this menu, you can select the channel or frequency setting for the adjustment of the RF output. The channel setting covers the range of channels C05…C12, C21…C69, the frequency setting covers the range from 42.0 … 860.0 MHz.

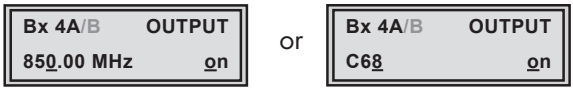
—> The COFDM signal is normally transmitted with a bandwidth of 8 MHz. This means that you can only use the channel centre frequency of the existing channel grid in the range of channels C21…C69 (frequency grid 8 MHz). The CCIR channel grid is 7 MHz in the range of the lower frequency bands (channels C5 … C12). If 8 MHz COFDM signal packages are transmitted in these channel ranges, this will result in interference (overlapping) and transmission problems.
For programming in these channel ranges and in the frequency ranges below them, we recommend starting with frequency 306 MHz going back in steps of 8 MHz (see frequency table on page 47). Please note thereby that many receivers cannot receive the channel ranges S21 … S41 (306 … 466 MHz).

- Use **+**/**-** to select channel setting "**Channel**" or frequency setting "**Freq.**".
- Press the **MODE** button.

—> The "Output channel" or "Output frequency" – "**OUTPUT**" menu is activated.

OUTPUT FREQUENCY, OUTPUT CHANNEL, MODULATOR

In this menu, dependent on the setting before, you set the output frequency (42.0 … 860.0 MHz) or the output channel (C05…C12, C21 … C69) of the channel strip. Additionally the modulator of the channel strip can be switched off or on.



- Use the **◄**/**►** buttons to position the cursor under the digit to be set for the frequency or channel display then use **+**/**-** to set the desired output frequency or channel.
- To switch off the modulator place the cursor under "**on**" using the **►** button and switch "**off**" the modulator of the channel strip using the **+**/**-** buttons.

—> The switched off modulator is indicated by " **- - -** " in the display.

- If the modulator is switched "**off**" use the **+**/**-** to switch it "**on**".
- Press the **MODE** button.

—> The "Output levels of the channel strips" – "**LEVEL**" menu is activated.

Output levels of the channel strips

This menu item is used to set the output levels of the modulators of the channel strips "**A**" and "**B**" **to the same value**.

- Measure and note down the output level of the channel strip. To adjust the output level to the output levels of the other cassettes please pay attention to chapter 6 "Final procedures".
- By repeatedly pressing the **AUDIO** button scroll back to the "Selecting the channel strip" menu.
- Select the other channel strip (page 23) and set the following menu items:
- "Selecting channel / frequency setting" (page 23).
- "Setting the output channel" or "Setting the output frequency" (page 24).
- Switch on the modulator if necessary (page 24).
- Measure and note down the output level.
- Activate the "**LEVEL**" menu of the channel strip with the higher output level.
- By pressing **+**/**-** adjust the higher output level of the one channel strip to the lower output level of the other channel strip incrementally ("**0**" … "**–10 dB**").
- If necessary activate the channel strip to be programmed.

- Press the **MODE** button.

—> The menu "Input parameter" – **INPUT**" is activated.

Input parameter

In this menu you have to set the corresponding input parameters for the transponder to be received.

Kind of modulation

- Using the buttons **+**/**-** select the corresponding kind of modulation of the transponder (COFDM 7MHz, COFDM 8MHz, QAM16…QAM256).

Symbol rate

If "QAM..." modulation is selected, the setting for the symbol rate appears at the right side.

- Use the ◄/► buttons to position the cursor under the digit to be set for the symbol rate then use + / - to set the corresponding symbol rate.

- Press the **MODE** button.

—> The menu "Input channel / Input frequency" – "**INPUT**" is activated.

Input channel / Input frequency

In this menu you have to set the corresponding input channel / input frequency for the transponder to be received.

- Use the ◄/► buttons to position the cursor under the digit to be set for the input channel / input frequency then use + / - to set the desired input channel / input frequency.

—> Once the RF receiver has synchronised to the input signal, "OK" is displayed.
—> If "– –" appears in the second line of the display, there is no input signal present. Check the configuration of the antenna system and the head-end station as well as the preceding settings of the cassette.

- Press the **MODE** button.

—> The menu "Station filter " – "**PROGRAM**" is activated.

Station filter

If no station is found the error message "**FILTER no Service**" is displayed. Check the configuration of the antenna system and head-end station as well as the previous settings of the cassette in question.

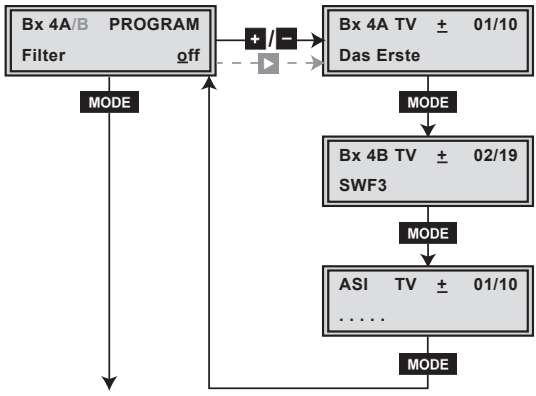
If the input signal path "**A+B+ASI=1 ASI=2**" is selected the station filter of channel strip "**B**" is used in the channel strip "**A**". Therefore perform the setting for channel strip "**B**" (input channel) according to page 25, before activating the "Setting the station filter" – "**PROGRAM**" menu.
If the input signal path "**A+ASI=1 B+ASI=2**" or "**A+ASI=1 A+ASI=2**" is selected the channel strips can be programmed one after the other.

The default setting for the station filter is "**off**". In this menu you define the stations received to be transmitted. If stations are activated the output data rate increases.
If the station filter is switched off (factory default) all stations of the transport stream passes the station filter. As soon as the station filter is activated all stations are inactive.

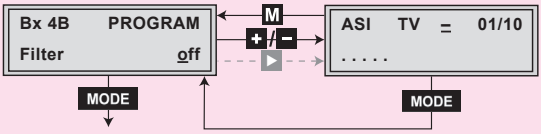
The figure of the menu below is dependent on the setting of the "Input signal path" menu (page 21).
The menu shows the setting "**A+B+ASI = 1 ASI = 2**".
With this setting the transport stream of channel strip "**B**" is routed to the transport stream of channel strip "**A**" and therefore cannot be set in channel strip "**B**". Programming channel strip "**B**" the transport stream coming from the ASI input can be processed only.

Menu setting "A+B+ASI = 1 ASI = 2"

Channel strip "**A**"



—> The following figure shows the "Station filter" menu of channel strip "**B**".



- Press the **+**/**-** button.

—> All stations from the channel strip will be read, and then displayed with name and station type.

—> If no station is found, the following error message will appear in the display: "**FILTER no Service**".
In this case, check the configuration of the antenna system and head-end station, as well as the previously adjusted settings for the cassette and the components connected to the ASI input.

—> The display shows e.g.: **Bx 4A TV + 01/10**
Das Erste

Meaning of the indicators in the example:

"**Bx 4A**"	Slot 4, channel strip "**A**"
"**TV**"	TV channel type
" **+** "	The currently selected station is switched on.
"**01/10**"	The 1st of 10 stations is being displayed.
"**Das Erste**"	Station name

Further possible terms displayed:

"**RA**"	Radio channel type For radio stations, the background of the screen of the connected TV or test receiver is darkened.
" **–** "	The currently selected station is switched off.
" * "	The star means that the TV or radio station selected is encoded. To enable the stations, the CA module and the appropriate smart card of the station provider are required.

—> If a service number (e.g. "**131**") appears instead of "**TV**" or "**RA**", this indicates that an unnamed station or an undefined data stream is being received.

- Use the ◄/► buttons to call up the stations in sequential order, then use +/- to activate (indicated by " + ") or to deactivate them (indicated by " – ").

- Press the MODE button.
- Set the station filters of channel strip "**B**" and "**ASI**" in the same way as channel strip "**A**".

—> To return to the previous station filter press the AUDIO button.

- To save changes and to activate the station filters press the MODE button.

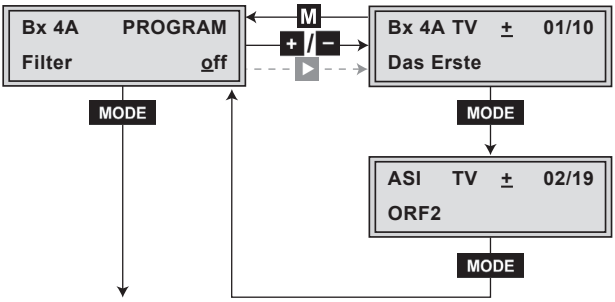
—> The display shows "**PROGRAM Filter on**".
—> If stations are activated the corresponding PIDs (audio, video, text) are inserted into the data stream and the PAT and SDT tables are updated.

- In the "**PROGRAM Filter on**" menu the station filters switched on can be switched "**off**" using the buttons +/- if necessary.

Menu setting "A+ASI = 1 B+ASI = 2".

Menu setting "A+ASI = 1 A+ASI = 2"

Channel strip "**A**"



- Set the channel strip "**A**" or "**B**".

—> The setting of the channel strips "**A**" and "**B**" is identical and follows the description above.

- Press the **MODE** button.

—> The "Output parameter" – "**COFDM-MODE**" menu is activated when the channel strips "**A**" without a CA module installed and "**B**" are programmed. Please take note of the tables below before setting the COFDM parameters.

—> Programming the channel strip "**A**" with a CA module installed the settings for the CA module are activated (page 43).

COFDM PARAMETERS

The tables below show the dependence of the transmittable net data rate on the settings of the COFDM parameters.
The conversion of the net data rate into the gross data rate displayed in the "Output data rate" menu (page 36) is made according to the following formula:

$$\text{Gross data rate} = \frac{204 \times \text{net data rate}}{188}$$

		Net data rate [kbit/s] at a bandwidth of 8 MHz			
		Guard interval			
Modulation	Code rate	1/4	1/8	1/16	1/32
QPSK	1/2	4976	5529	5855	6032
	2/3	6635	7373	7806	8043
	3/4	7465	8294	8782	9048
	5/6	8294	9216	9758	10053
	7/8	8709	9676	10246	10556
16 QAM	1/2	9953	11059	11709	12064
	2/3	13271	14745	15612	16086
	3/4	14929	16588	17564	18096
	5/6	16588	18431	19516	20107
	7/8	17418	19353	20491	21112
64 QAM	1/2	14929	16588	17564	18096
	2/3	19906	22118	23419	24128
	3/4	22394	24882	26346	27144
	5/6	24882	27647	29273	30160
	7/8	26126	29029	30737	31668

If the bandwidth is decreased by 1 MHz the transmittable data rate is decreased by approx. 1/8.

		Net data rate [kbit/s] at a bandwidth of 7 MHz			
		Guard interval			
Modulation	Code rate	1/4	1/8	1/16	1/32
QPSK	1/2	4354	4838	5123	5278
	2/3	5806	6451	6830	7037
	3/4	6532	7257	7684	7917
	5/6	7257	8064	8538	8797
	7/8	7620	8467	8965	9237
16 QAM	1/2	8709	9676	10246	10556
	2/3	11612	12902	13661	14075
	3/4	13063	14515	15369	15834
	5/6	14515	16127	17076	17594
	7/8	15240	16934	17930	18473
64 QAM	1/2	13063	14515	15369	15834
	2/3	17418	19353	20491	21112
	3/4	19595	21772	23053	23751
	5/6	21772	24191	25614	26390
	7/8	22861	25401	26895	27710

		Net data rate [kbit/s] at a bandwidth of 6 MHz			
		Guard interval			
Modulation	Code rate	1/4	1/8	1/16	1/32
QPSK	1/2	3732	4147	4391	4524
	2/3	4976	5529	5855	6032
	3/4	5599	6221	6587	6786
	5/6	6221	6912	7318	7540
	7/8	6532	7257	7684	7917
16 QAM	1/2	7465	8294	8782	9048
	2/3	9953	11059	11709	12064
	3/4	11197	12441	13173	13572
	5/6	12441	13824	14637	15080
	7/8	13063	14515	15369	15834
64 QAM	1/2	11197	12441	13173	13572
	2/3	14929	16588	17564	18096
	3/4	16796	18662	19760	20358
	5/6	18662	20735	21995	22620
	7/8	19595	21772	23053	23751

	Transmission parameters for DVB-T at a bandwidth of 8 MHz											
Transmission mode	**2k**				**4k**				**8k**			
Symbol duration T_S [µs]	224				448				896			
Carrier space Δ f [kHz]	4.4643				2.232				1.116			
$(n_{carrier})_{theoretical}$	2048				4096				8192			
$(n_{carrier})_{real}$	1705				3410				6817			
Used bandwidth [MHz]	7.61				7.61				7.61			
Total symbol duration T_{GS} [µs]	280	262	238	231	560	504	476	462	1120	1008	952	924
Guard interval T_G [µs]	56	28	14	7	112	56	28	14	224	112	56	28
T_G / T_S	1/4	1/8	1/16	1/32	1/4	1/8	1/16	1/32	1/4	1/8	1/16	1/32

	Transmission parameters for DVB-T at a bandwidth of 7 MHz											
Transmission mode	**2k**				**4k**				**8k**			
Symbol duration T_S [µs]	224				448				896			
Carrier space Δ f [kHz]	4.4643				2.232				1.116			
$(n_{carrier})_{theoretical}$	2048				4096				8192			
$(n_{carrier})_{real}$	1705				3410				6817			
Used bandwidth [MHz]	6.66				6.66				6.66			
Total symbol duration T_{GS} [µs]	320	288	272	264	620	576	544	528	1280	1152	1088	1056
Guard interval T_G [µs]	64	32	16	8	128	64	32	16	256	128	64	32
T_G / T_S	1/4	1/8	1/16	1/32	1/4	1/8	1/16	1/32	1/4	1/8	1/16	1/32

	Transmission parameters for DVB-T at a bandwidth of 6 MHz											
Transmission mode	**2k**				**4k**				**8k**			
Symbol duration T_S [µs]	224				448				896			
Carrier space Δ f [kHz]	4.4643				2.232				1.116			
$(n_{carrier})_{theoretical}$	2048				4096				8192			
$(n_{carrier})_{real}$	1705				3410				6817			
Used bandwidth [MHz]	5.71				5.71				5.71			
Total symbol duration T_{GS} [µs]	373	336	317	308	767	672	634	616	1493	1344	1269	1232
Guard interval T_G [µs]	74.7	37.3	18.7	9.3	149	75	37.4	18.6	298.7	149.3	74.6	37.3
T_G / T_S	1/4	1/8	1/16	1/32	1/4	1/8	1/16	1/32	1/4	1/8	1/16	1/32

Output parameters

In this menu, you can set the bandwidth, the carrier modulation and the spectral position of the output signal.

Bandwidth of the output signal

To transmit the output signal in the channel range of C21 to C69 a bandwidth of 8 MHz can be used. In the channel range of C5 to C12 a bandwidth of ≤ 7 MHz must be set. Therefore observe the current output data rate (menu "Output data rate", page 36). If necessary change the COFDM settings or delete services by the station filter (page 27).
If frequency setting is selected you can set the bandwidth dependent on the frequency of the adjacent channel.

- Use **+**/**-** to set the bandwidth of the output signal ("**5 MHz**" … "**8 MHz**").

Carrier modulation

In this menu item the carrier modulation is set. At this the setting "**QPSK**" corresponds to the lowest and the setting "**QAM64**" to the highest output data rate.

- Use the **◄**/**►** buttons to place the cursor under "**QPSK / QAM...**".
- Set the carrier modulation of the output signal using the **+**/**-** buttons ("**QPSK**", "**QAM16**", "**QAM64**").

Inverting the user signal

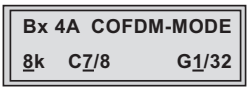
For exceptional cases and "older" digital cable receivers, the spectral position of the user signal can be inverted "**NEG**". The default setting is "**POS**".
- Use **◄**/**►** to place the cursor under "**POS**".
- Use **+**/**-** to set the spectral position to "**NEG**".

- Press the **MODE** button.

—> The "Transmission parameters" – "**COFDM-MODE**" menu is activated.

Transmission parameters

In this menu you can set the transmission modes, the code rate and the guard interval.



Transmission mode

In this menu item you set the quantity of carriers:
2k mode: 1512 carrier for user data (total 1705 carriers)
4k mode: 3024 carrier for user data (total 3410 carriers)
8k mode: 6048 carrier for user data (total 6817 carriers)

—> The standard modes for DVB-T are 2k and 8k.

- Using the + / - buttons set the transmission mode required ("**2k**" … "**8k**").

Code rate

During a transmission data can be lost or changed. To recover this data redundancy is added to the signal to be transmitted (forward error correction). The factor of the quantity of redundancy contained in the bits transmitted is called code rate.
Using the setting "**C7/8**" you can get the highest output data rate at lowest redundancy.

- Use the ◄ / ► buttons to place the cursor under "**C...**".
- Set the code rate required using the + / - buttons ("**C1/2**", "**C2/3**", "**C3/4**", "**C5/6**", "**C7/8**").

Guard interval

In this menu item you set the relation of the duration of the user symbols to the duration of the guard intervals to be transmitted. A high guard interval, e.g. "**G1/4**" causes a low output data rate. For cable networks the setting "**G1/32**" is adequate.

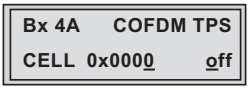
- Use the ◄ / ► buttons to place the cursor under "**G...**".
- Set the guard interval required using the + / - buttons ("**G1/4**", "**G1/8**", "**G1/16**", "**G1/32**").

- Press the **MODE** button.

—> The "Transmitter identification" – "**COFDM TPS**" menu is activated.

TRANSMITTER IDENTIFICATION

At terrestrial transmission an identification is referred to each COFDM modulated transmitter. When COFDM modulated signals are fed into cable networks this identification is not necessary usually. If receiving problems should occur you must refer a transmitter identification (CELL ID) to each output channel and switch "**on**" the transmitter identification.



- Use the ◄/► buttons to position the cursor under the digit of the hexadecimal number to be set.
- Press +/- to set the respective digit of the hexadecimal number.
- Repeat the procedure by the quantity of the digits to be set.
- Using the ► button place the cursor under "**off**" and switch "**on**" the transmitter identification using the +/- buttons.

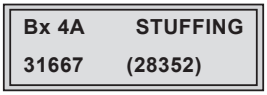
—> By pressing the ◄ button you return to the hexadecimal number setting.

- Press the **MODE** button.

—> The "Output data rate" – "**STUFFING**" menu is activated.

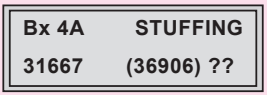
OUTPUT DATA RATE

This menu shows the output data rate defined using the COFDM settings and the current output data rate.



31667 (= "Number 1"): Maximum gross output data rate
(**28352**) (= "Number 2"): The current measured gross output data rate.
If the station filter is set correctly, this value is lower than the value of the "Number 1". The value fluctuates, since the data rates of individual stations are dynamically modified by the broadcasters.

—> Is the "Number 2" higher than "Number 1" question marks "**??**" appear in the display. In this case correct the COFDM settings (pages 33 ...) or the settings of the station filter (page 27).

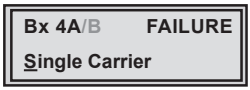


- Press the **MODE** button.

—> The "Substitute signal in the case of an incorrect input signal" – "**FAILURE**" menu is activated.

Substitute signal in the case of an incorrect input signal

You use this menu to set whether a COFDM signal filled with "**Null Packets**", a COFDM signal filled with null packets and self-made tables "**Tables**" or a "**Single Carrier**" signal should be provided as an output signal whenever an incorrect input signal occurs. Self-made tables are transmitted furthermore.



- Use the **+**/**-** buttons to set the output signal required.
- Press the **MODE** button.

—> The "Transport stream ID and the ORGNET-ID" – "**TS/ONID**" menu is activated.

Transport stream ID and the ORGNET-ID

If the stations of a transponder are split into the transport streams of the channel strips "**A**" and "**B**", one of the both transport streams a new identification must be allocated to realise the channel search of the settop boxes connected without mistakes.
If the ORGNET-ID is changed a new NIT must be generated (page 38).

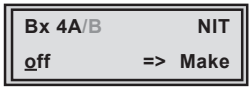
- Use the **◄**/**►** buttons to position the cursor under the digit of the hexadecimal number to be set.
- Press **+**/**-** to set the respective digit of the hexadecimal number.
- Repeat the procedure by the quantity of the digits to be set.
- Using the **►** button place the cursor under "**off**" and switch "**on**" the transmitter identification using the **+**/**-** buttons.

—> By pressing the **◄** button you return to the hexadecimal number setting.

- Press the **MODE** button.

—> The "Network Information Table" – "**NIT**" menu is activated.

Network Information Table (NIT)



- To switch NIT on/off ("**on**"/"**off**") press the **+**/**-** buttons.
- Press the **►** button to activate NIT "**Make**".

—> All active cassettes which are able to output a NIT ("NIT cassettes") must be set and ready for reception.
—> The NITs of all "NIT cassettes" are switched on.
—> The cassette fetches all the information (output frequencies, output data rates, etc.) it needs from all the "NIT cassettes" in order to generate the NIT. This process may take a few seconds.
Then the NIT is generated, added and sent to all "NIT cassettes". The other "NIT cassettes" also add this new NIT. The status of all "NIT cassettes" in the NIT menu changes to "**on**".
The display shows: "**read ... / copy ...**".

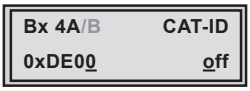
- To switch off the new NIT ("**off**") press the **-** button.

—> The NITs of the other "NIT cassettes" will stay switched on. When the NIT of the cassette is switched on again ("**on**") by pressing the **-** button, the previously generated NIT is added again. If you have changed parameters in the meantime, you must first select "**Make**" to generate a new, up-to-date NIT.

- Press the **MODE** button.

—> The "Network/Operator identification" – "**CAT-ID**" menu is activated.

In this menu, you can change the network/operator identification (CAT-ID – **C**onditional **A**ccess **T**able - **Id**entification), for example of the visAvision transponder (Eutelsat 8° West).



CAT is not to be changed:

- Press the **MODE** button.

—> The "Deleting a PID" – "**DROP**" menu is activated (page 40).

Changing the CAT:

The network operator e.g. requires that you set the operator ID of the visAvision transponder to "2".

- Use the ◄/► buttons to position the cursor under the digit to be set.
- Use **+**/**-** to change the operator ID from "**0xDE00**" to "**0xDE02**".
- Use the ► button to position the cursor under "**off**," then use **+**/**-** to activate the new CAT ("**on**").

—> The menu display switches to "**modified**".
—> If you try to change the network/operator identification (operator ID) of a transponder which cannot be modified, "**not modified**" appears in the display.

- Press the **MODE** button.

—> The "Deleting a PID" – "**DROP**" menu is activated.

Deleting a PID

In this menu a PID of the transport stream can be deleted.

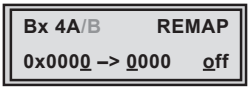
- Use the ◄/► buttons to place the cursor under the respective digit of the hexadecimal number of the PID to be deleted ("**0x0000**") and set the hexadecimal number using **+**/**-**.
- Use the ► button to set the cursor under "**off**" and delete the PID using the **+**/**-** buttons ("**on**").

- Press the **MODE** button.

—> The "Renaming a PID" – "**REMAP**" menu is activated.

Renaming a PID

In this menu you can allocate a new address to a PID retaining the complete data content.



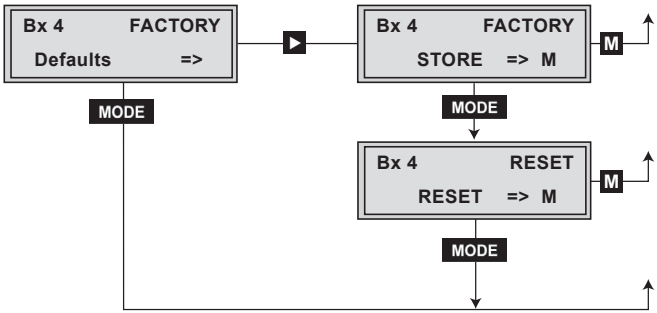
- Use the ◄/► buttons to place the cursor under the respective digit of the hexadecimal number of the PID to be changed ("**0x0000**") and set the hexadecimal number using **+**/**-**.
- Use the ◄/► buttons to place the cursor under the respective digit of the hexadecimal number of the new PID ("**–> 0000**").
- Set the hexadecimal number using **+**/**-**.
- Use the ► button to set the cursor to "**off**" and rename the PID using the **+**/**-** buttons ("**on**").

- Press the **MODE** button.

—> The "Factory reset" – "**FACTORY Default**" menu is activated.

Factory reset / Soft reset

Via this menu you get access to the submenus to reset all settings to the factory defaults or to perform a soft reset (cassette restart).



Factory reset

- Press the ▶ button.

—> The "Factory Store" submenu is activated.

- In order to perform a factory reset press the **M** button.

—> The cassette is reset to factory defaults. The display shows "STORE"
—> Back to "Selecting the cassette" (page 20).

- In order to perform a soft reset (cassette restart) press the **MODE** button.

—> The "Reset" submenu is activated.

Soft reset

In this submenu you can perform a soft reset (cassette restart).

- In order to perform a soft reset (cassette restart) press the **M** button

—> The cassette is restarted.

- If you don´t like to perform a soft reset press the **MODE** button.

—> Back to menu "Channel Strip" (page 23).
—> If necessary set another channel strip.

Saving settings

- Press the **M** button.

—> Returning to "Selecting the cassette" menu via connection (page 20).
—> The settings are saved.
—> If functions of the TPS module are activated, their status is shown in the second line of the menu:
"**M**" Station filter is switched on.
"**N**" NIT is activated.
"**C**" Network/operator identification CAT is activated.
—> If necessary set channel strip "**B**".

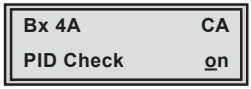
Operation with a CA module

In order for this function of the CA module to be possible, stations capable of being descrambled by the CA module you are using and your smart card must be selected in the "Station filter" – "**PROGRAM**" menu (page 27).
Short-term picture loss may occur when switching between scrambled and unscrambled broadcasts within one service (e.g. scrambled stations and unscrambled regional broadcasters).

—> The "PID monitoring" – "**CA**" menu is activated.

Setting the PID monitoring

The factory default of the PID monitoring is switched on.
If particular PIDs are not descrambled the CI module is reset. Additionally dropouts may occur if several stations are descrambled. To prevent this the PID monitoring can be switched off.

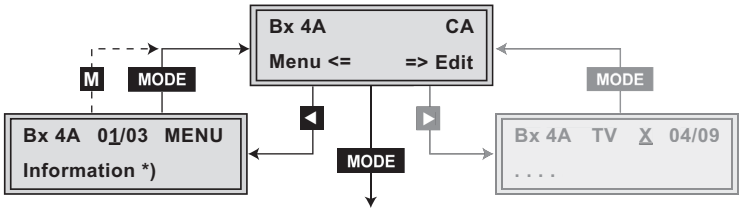


- Use the **+** / **-** buttons to switch "**off**" or "**on**" the PID monitoring.
- Press the **MODE** button.

—> The "Configuring the CA module" – "**CA**" menu is activated.

Configuring the CA module

The menu varies according to which CA module you are using. For this reason, please refer to the operating manual of your particular CA module. The relevant information is shown in the display of the head-end station. This may appear as a fixed display or as scrolling text according to display capabilities.



—> By pressing the **MODE** button you can skip the "Configuring the CA module" – "**CA**" menu and activate the "Output parameters" – "**COFDM-MODE**" menu (page 33).

- Press the ◄ button to activate the menu of the CA module.

—> The display shows e.g.: **Bx 4A 01/03 MENU**
Information
Meaning of the indicators:
"**Bx 4A**" Slot 4, channel strip "**A**"
"**01/03**" The first of three menu items is activated.
"**MENU**" The menu of the CA module is activated.

For the explanation of further details please use the operating instructions of the CA module used.

- Use the **+**/**-** buttons to activate the menu desired.
- Press the ► button to activate the menu.
- Use the **+**/**-** buttons to select the function desired.
- To set the CA module use the ◄/► and **+**/**-** buttons.
- All settings are saved by pressing the **M** button.

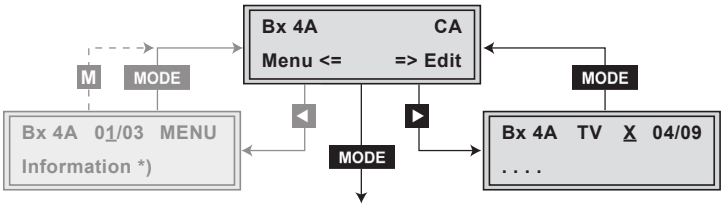
—> You will be returned to the "Configuring the CA module" – "**CA**" menu item.
—> By pressing the **MODE** button you can cancel the settings in the menu of the CA module. You will be returned to the "Configuring the CA module" – "**CA**" menu.

- Press the ► button.

—> The "Station filter (descrambling)" – "**Edit**" menu is activated.

STATION FILTER (DESCRAMBLING)

In this menu you select the desired stations from the scrambled data stream, which are to be descrambled.



—> The display shows e.g.: **Bx 4A TV X 04/09**
. . . .

Meaning of the indicators in the example:

"**Bx 4A**"	Slot 4, channel strip "**A**"
"**TV**"	TV channel type
"**X**"	The currently selected station is to descramble.
"**04/09**"	The 4th of 9 stations read is being displayed.
"**. . . .**"	Station name

Further possible terms displayed:

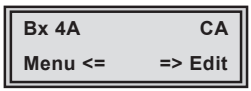
"**RA**"	Radio channel type
"**0**"	The currently selected station is not to descramble.

- Use the ◄/► buttons to call up the stations in sequential order which are to be descrambled, then use + / - to descramble ("**X**") or not to descramble them ("**0**").

Save changes and activate the station filter:

- Press the **MODE** button.

—> The filter is activated.
The display shows the "Configuring the CA module" – "**CA**" menu.



- Press the **MODE** button.

—> The "Output parameter" – "**COFDM-MODE**" menu is activated (page 33).

After installing the head-end station, upgrading accessories or installing cassettes it is necessary to tighten all cable connections, cable terminals and cover screws in order to maintain compliance with current EMC regulations securely.

- Securely tighten the cable connections using an appropriate open-ended spanner.
- Measure the output levels of the other cassettes and tune them to a uniform output level using the appropriate level controls or software dependent on the head-end station used. Please regard the assembly instructions of the respective head-end station.

—> In order to prevent interference within the head-end station and the cable system, the output levels of the digital cassettes must be set lower by 8 dB compared to analogue cassettes.

- Mount the front cover (see assembly instructions of the head-end station).

Advice for a frequency grid (8 MHz) in the band I/III

Frequenz Frequency [MHz]	Frequenz Frequency [MHz]	Frequenz Frequency [MHz]	Frequenz Frequency [MHz]	Frequenz Frequency [MHz]	Frequenz Frequency [MHz]
42.00	82.00	146.00	186.00	226.00	266.00
50.00	114.00	154.00	194.00	234.00	274.00
58.00	122.00	162.00	202.00	242.00	282.00
66.00	130.00	170.00	210.00	250.00	290.00
74.00	138.00	178.00	218.00	258.00	298.00

Channel-/frequency grid for DVB-T (band III, bandwidth 7 MHz)

Kanal Channel	Frequenz Frequency [MHz]	Kanal Channel	Frequenz Frequency [MHz]	Kanal Channel	Frequenz Frequency [MHz]
C 5	177.5	C 8	198.5	C 11	219.5
C 6	184.5	C 9	205.5	C 12	226.5
C 7	191.5	C 10	212.5		

CCIR – Hyperband (frequency grid 8 MHz)

Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]
S 21	306.00	S 26	346.00	S 30	378.00	S 34	410.00	S 38	442.00
S 22	314.00	S 27	354.00	S 31	386.00	S 35	418.00	S 39	450.00
S 23	322.00	S 28	362.00	S 32	394.00	S 36	426.00	S 40	458.00
S 24	330.00	S 29	370.00	S 33	402.00	S 37	434.00	S 41	466.00
S 25	338.00								

CCIR – Band IV/V (frequency grid 8 MHz)

C 21	474.00	C 31	554.00	C 41	634.00	C 51	714.00	C 61	794.00
C 22	482.00	C 32	562.00	C 42	642.00	C 52	722.00	C 62	802.00
C 23	490.00	C 33	570.00	C 43	650.00	C 53	730.00	C 63	810.00
C 24	498.00	C 34	578.00	C 44	658.00	C 54	738.00	C 64	818.00
C 25	506.00	C 35	586.00	C 45	666.00	C 55	746.00	C 65	826.00
C 26	514.00	C 36	594.00	C 46	674.00	C 56	754.00	C 66	834.00
C 27	522.00	C 37	602.00	C 47	682.00	C 57	762.00	C 67	842.00
C 28	530.00	C 38	610.00	C 48	690.00	C 58	770.00	C 68	850.00
C 29	538.00	C 39	618.00	C 49	698.00	C 59	778.00	C 69	858.00
C 30	546.00	C 40	626.00	C 50	706.00	C 60	786.00		

Declaration of CE conformity

GSS	**Konformitätserklärung** **Declaration of Conformity / Déclaration de Conformité** **007/ 12**	CE

Der Hersteller/Importeur The manufacturer/importer Le producteur/importateur	**GSS GRUNDIG SAT-Systems GmbH**
Anschrift / Address / Adresse	**Beuthener Straße 43, D-90471 Nürnberg, Germany**

erklärt hiermit eigenverantwortlich, daß das Produkt:
declare under their sole responsibility that the product: / déclare, que le produit:

Bezeichnung / Name / Description	**Head- End Digital Modulator** **DVB-T / - C → COFDM**
Type / Model / Type	**GSS HDMC 1000 T**
Bestell-Nr. / Order-No. / N° de réf.	**GAS 5000**

folgenden Normen entspricht:
is in accordance with the following specifications: / correspond aux normes suivantes:

EN 50083-2:	***2006***
EN 60065 :	***2002***
EN 60065 + A1:	***2006***
EN 60065 + A11	***2008***

Das Produkt erfüllt somit die Forderungen folgender EG-Richtlinien:
Therefore the product fulfils the demands of the following EC-Directives:
Le produit satisfait ainsi aux conditions des directives suivantes de la CE:

2006/95/EG	**Richtlinie betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen** **Directive relating to electrical equipment designed for use within certain voltage limits** **Directive relatives au matériel électrique destiné à être employé dans certaines limites de tension**
2004/108/EG	**Richtlinie über die elektromagnetische Verträglichkeit** **Directive relating to electromagnetic compatibility** **Directive relatives à la compatibilité électromagnétique**

Nürnberg, 21. August 2012

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